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Comparative Insect Faunas between Ganghwado and Six Others Islands of West Coastal in Incheon, Korea

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Abstract: This study was conducted to investigate the biogeographic characteristics of the insect faunas of the seven islands of the west coast of Incheon, Korea, using a quantitative analysis method. The faunal similarity was examined using the Bray & Curtis similarity. The obtained similarity value matrix was examined with cluster analysis using the UPGMA method. The recorded number of each species in the areas was 1,001 from 12 orders and they were distributed on the seven islands surveyed. Among the surveyed islands, Seokmodo had the highest number of species with 497, while Yeonpyeongdo had the lowest with 136 species. The species composition of insects reported in Ganghwado was 309 species belonging to seven orders. The similarity values between the seven localities investigated ranged from 24.907 (Gyodongdo to Yeonpyeongdo) to 49.899 (Baengnyeongdo to Ganghwado). That is, the species composition of Baengnyeongdo (47.90%) was similar to that of Ganghwado, while it was different from that of Yeonpyeongdo (25.28%). The cluster analysis using a similarity index shows that all the islands in these areas can be divided into 3 groups at the level of 30.97%.

Keywords: Faunal similarity, Biogeographic characteristics, Quantitative analysis, Island biogeography, Insect

Introduction

Since Darwin's visit to the Galápagos Islands, ecologists have been using islands to study the colonization, adaptation, speciation, and distribution of species (Preston 1960, Simberloff and Abele 1982, Quammen 1996, MacArthur and Wilson 2001, Whittaker *et al.* 2005, Smith and Smith 2006). Islands are surrounded by sea water, and may or may not exist as parts of a continental land mass. Islands arise due to reef growth, and usually subside over time due to erosion and changing sea levels. When islands emerge, they undergo the process of ecological succession as species colonize the island. New species cannot immigrate via land, and instead must arrive via air, water, or wind. As a result, organisms with high dispersal capabilities, such as plants and birds, are much more commonly found on islands than those with poor dispersal abilities such as mammals (Johnson 1980, Quammen 1996). Of the species that arrive on an island, only some will be able to survive and establish populations. Naturally, islands have fewer species than mainland habitats. Island populations are small and exhibit

low genetic variability, but are isolated from the predators and competitors that they initially evolved with. This can lead to a process called ecological release, where a species is released from its ancestral community interactions and then colonizes new niches (Paulay 1994). In response to these changing ecological pressures, island species can become much more docile than their mainland counterparts, and may grow larger or smaller. The formation of new islands and their isolation from the mainland provide many unoccupied niches for species to adapt to. Since immigration of predators and competitors is limited, many organisms are able to persist in these new niches. This results in a high occurrence of endemism, a phenomenon where species are unique to a localized area (Justin 2008). Because the distributions of these populations are limited by their island habitats, they tend to have fewer individuals than their mainland counterparts and lower genetic variation. This, along with the behavioral and ecological factors mentioned above, makes island species more vulnerable to extinction (Paulay 1994).

Early biogeographers, who noted that large islands hold more species than small islands, noticed the influence an area has on the richness of species. Preston (1962) identified that a 10-fold increase in area leads to a doubling of the number of species. In addition, species richness is effected

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by the distance an island is from the mainland. MacArthur and Wilson (1967) developed the theory of island biogeography using species-area and species-distance effects. The theory shows that the number of species established on an island represents a dynamic equilibrium between immigration and extinction.

The information on insects in west coastal islands has been increasing with the progress of taxonomic researches (Korea Forest Service 2000, Nam *et al.* 2007, National Institute of Environmental Research 2007, Byun *et al.* 2010). However, there had been no study that tried to cover the fauna similarity of the whole west coastal region in Korea and this research was carried out to fill this void in the present research. In order to examine the comparability of insect faunas of the whole west coastal islands near Incheon, seven sites were selected; Baengnyeongdo, Boleumdo, Daecheongdo, Ganghwado, Gyodongdo, Seokmodo, and Yeonpyeongdo. Islands are attractive sites for ecological research because they provide clear examples of evolution in action. They show interesting patterns of colonization, adaptation, and speciation.

Materials and Methods

Insect survey and study areas

The data used in this paper was collected from Ganghwado and six other west coastal islands in Incheon, Korea, which have been well investigated. The data from three islands, Boleumdo, Gyodongdo and Seokmodo was directly collected

by the author of this study while, the data from the remaining islands is from the references of them (Korea Forest Service 2000, Nam *et al.* 2007, National Institute of Environmental Research 2007, Byun *et al.* 2010). The order of insect orders was followed according to the check list of insects from Korea (The Entomological Society of Korea and the Korean Society of Applied Entomology 1994), genera and species were alphabetically arranged. The geographical positions of each island are shown in Fig. 1.

Data analysis

The similarity between sampling sites was calculated using the Bray & Curtis (1957) similarities, which is based on species presence-absence using a software program PRIMER v6 (PRIMER-E Ltd). Furthermore, the obtained value matrix is examined with cluster analysis using the UPGMA method.

The area of the islands was calculated, excluding built-up and agricultural areas using a land cover map to identify species-area relations and the nearest distance to mainland was measured identify species-distance relations. The areas and distances were transformed using a logarithmic function (MacArthur and Wilson 2001).

Results

Number of species recorded

There were 1,001 species on the seven investigated islands

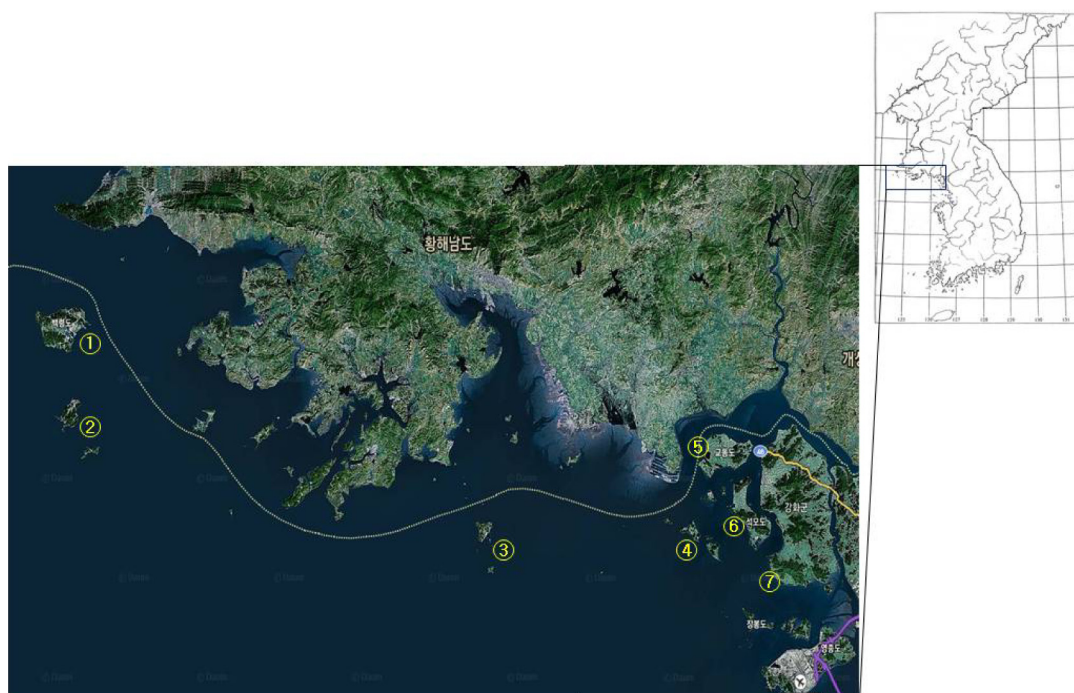


Fig. 1. Map of studied areas. 1. Baengnyeongdo, 2. Daecheongdo, 3. Yeonpyeongdo, 4. Boleumdo, 5. Gyodongdo, 6. Seokmodo, 7. Ganghwado.

Table 1. Comparative diversity of insects between Ganghwado and other Islands

Order	Total	Other Islands	Ganghwado			
			No. of species	: Total (%)	: Other Is. (%)	RD* (%)
Odonata	14	13	9	64.3	69.2	2.9
Blattaria	3	3	-	-	-	-
Mantodea	4	4	-	-	-	-
Isoptera	1	1	-	-	-	-
Dermaptera	7	7	-	-	-	-
Orthoptera	60	60	13	21.7	21.7	4.2
Hemiptera	103	101	29	28.2	28.7	9.5
Homoptera	28	19	12	42.9	63.2	3.9
Neuroptera	6	6	-	-	-	-
Coleoptera	210	197	41	19.5	20.8	13.4
Hymenoptera	76	68	17	22.4	25.0	5.6
Diptera	51	42	23	45.1	54.8	7.5
Lepidoptera	437	417	165	37.8	39.6	53.9
Total	1,001	938	306	30.6	32.6	100.0

*Relative Dominance

belonging to 12 orders (Table 1, Appendix 1). Among the seven islands mentioned above, Seokmodo has the highest number of species, 497 species under 12 orders, while Yeonpyeongdo has the lowest, 136 species under 8 orders. The species composition of insects reported in Ganghwado was 309 species under seven orders. As a result of comparing the similarity of the orders of Ganghwado with those of the six other islands, Odonata exhibited the highest, 69.2%, while Coleoptera had the lowest, 20.8% (Table 1). 62 species, 1 species in Odonata, 2 species in Hemiptera, 9 species in Homoptera, 13 species in Coleoptera, 8 species in Hymenoptera, 9 species in Diptera, and 20 species in Lepidoptera were found only in Ganghwado, while 19 species, *Acrida cinerea cinerea*, *Atractomorpha lata*, *Oedaleus infernalis*, *Phaneroptera nigroantennata*, *Shirakiacris shirakii*, *Teleogryllus emma*, *Nysius (Nysius) plebejus*, *Bothrogonia japonica*, *Allograpta balteata*, *Sphaerophoria menthastri*, *Argyronome laodice*, *Artogeia melele*, *Artogeia rapae*, *Celastrina argiolus*, *Cyntia cardui*, *Everes argiades*, *Lycaena dispar*, *Papilio xuthus*, and *Polygonia c-aureum* were found in all the islands investigated (Appendix 1).

Faunal similarity

Table 2 shows the similarity values between the seven

localities of the studies areas. The values range from 24.907 (Gyodongdo to Yeonpyeongdo) to 49.899 (Baengnyeongdo to Ganghwado). In the islands of west coastal region, Korea and Ganghwado, the similarity values range from 25.282 (to Yeonpyeongdo) to 47.899 (Baengnyeongdo). These aspects are clearly found in a cluster analysis of Bray & Curtis similarity using the UPGMA method (Fig. 2).

Island biogeography

It was identified that the results are divided into two groups on the species-area curve (Fig. 3), near islands (Boleumdo, Gyodongdo and Seokmodo) and far islands (Baengnyeongdo, Daecheongdo, and Yeonpyeongdo) from the continental mainland. The slope of each species-area curve could be expressed by a decimal number, which varied from one group of islands to another (Presten 1960, Quammen 1996, MacArthur and Wilson 2001). The results of Ganghwado, which is effected human disturbances since it is connected to the mainland by a bridge seems to be an outlier. It turned out that islands far from the mainland showed less species richness than nearer islands (Fig. 4).

Discussion

The composition of insect species investigated in the seven

Table 2. Resemblance matrix to hierarchical cluster analysis. For area codes, see Fig. 1

	S1	S2	S3	S4	S5	S6	S7
S1	-						
S2	45.087	-					
S3	42.236	42.568	-				
S4	31.557	41.535	36.754	-			
S5	25.850	29.181	24.907	39.124	-		
S6	28.152	28.354	25.949	33.119	35.526	-	
S7	49.899	31.263	25.282	35.932	41.185	33.873	-

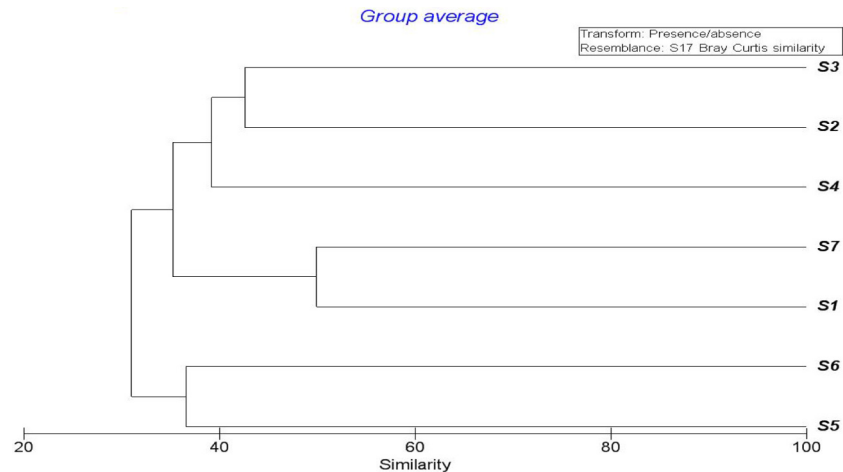


Fig. 2. Dendrogram showing the similarity among insect diversity in studied areas. For area codes, see Fig. 1

islands including Ganghwado is, as is seen in appendix 1, 1,001 species under 12 orders. Among all the investigated islands, Seokmodo showed the highest diversity with 497 species under 12 orders, while Yeonpyeongdo (136 species under 8 orders), Daecheongdo (160 species under 7 orders), and Baengnyeongdo (186 species under 7 orders) showed low diversity. These results coincided with the fact that the number of species increases on islands with larger areas or

on islands that are closer to the mainland. Also, it probably increases with the evolutionary time that has been available for colonization, niche specialization, and speciation. This study could expand by estimating the number of species on another island and comparing the number of species on inhabited and uninhabited islands (Preston 1960, Sanders 1968, Odum 1983, MacArthur and Wilson 2001). The dendrogram showing similarity among the seven islands is

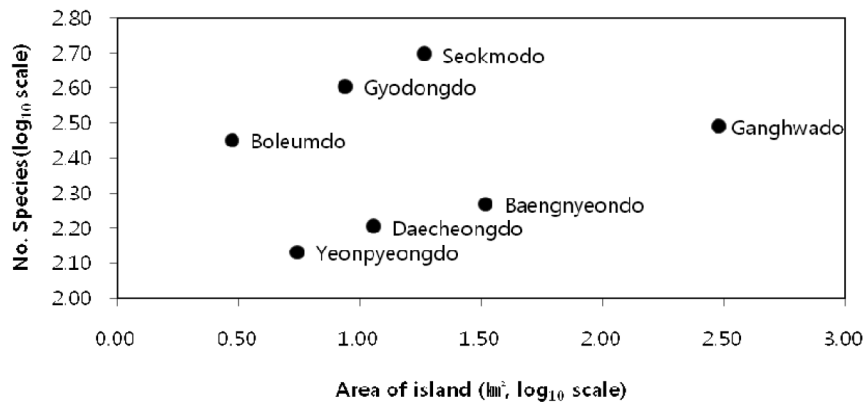


Fig. 3. Number of species on islands in relation to the area of an island. Both the x- and y-axes are plotted on a log10 scale.

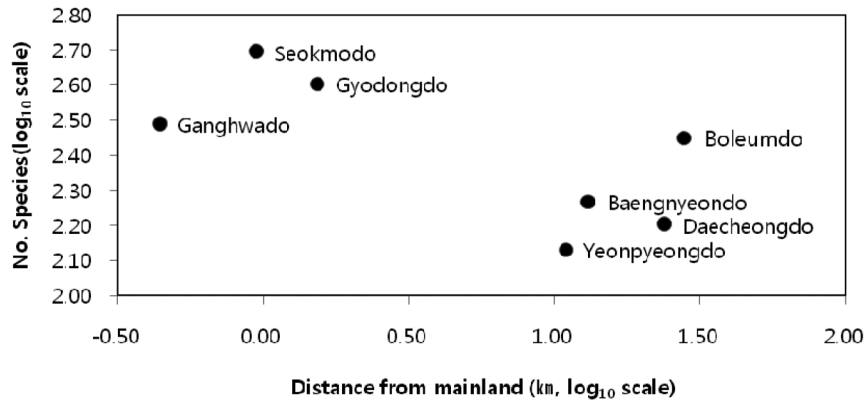


Fig. 4. Number of species on islands in relation to distance to the mainland. Both the x- and y-axes are plotted on a log10 scale.

Table 3. Number of species, area and distance to mainland of Ganghwado and other Islands

Name	No. Species	Area (km ²)	Dist. to mainland	Species (Log ₁₀)	Area (Log ₁₀)	Distance (Log ₁₀)
Baengnyeondo	186	32.7	13.05	2.27	1.51	1.12
Daecheongdo	160	11.4	23.88	2.20	1.06	1.38
Yeonpyeongdo	136	5.52	10.9	2.13	0.74	1.04
Boleumdo	283	2.95	27.9	2.45	0.47	1.45
Gyodongdo	403	8.72	1.53	2.61	0.94	0.18
Seokmodo	497	18.48	0.95	2.70	1.27	-0.02
Ganghwado	309	302.4	0.44	2.49	2.48	-0.36

shown in Table 2 and Fig. 2. Cluster analysis using a similarity index shows that all the islands of these areas can be divided into 3 groups at the level of 30.97%. The similarity between the first group (Baengnyeongdo and Ganghwado) and the second group (Daecheongdo, Yeonpyeongdo and Boleumdo) shows 35.23%, while the similarity between the first and third group (Gyodongdo and Seokmodo) shows 30.97%.

Acknowledgments

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Appendix 1. Taxonomic list of the insect in Gangwhado(Is.) and Other Islands of West Coastal Islands

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
Odonata							
<i>Davidius lunatus</i> Selys				○			
<i>Ischnura asiatica</i> (Brauer)				○	○		
<i>Lyriotheemis pachygastra</i> (Selys)		○			○		
<i>Orthetrum albistylum speciosum</i> (Uhler)		○		○	○	○	
<i>Orthetrum triangulare melania</i> (Selys)		○		○			
<i>Pantala flavescens</i> (Fabricius)		○		○	○	○	
<i>Pseudothemis zonata</i> Burmeister					○		
<i>Sympetrum darwinianum</i> Barteneff				○	○		
<i>Sympetrum depressiusculum</i> (Selys)				○	○		
<i>Sympetrum eroticum eroticum</i> (Selys)		○		○			
<i>Sympetrum infuscatum</i> (Selys)		○		○	○	○	
<i>Sympetrum parvulum</i> Barteneff					○		
<i>Sympetrum pedemontanum elatum</i> (Selys)					○		
<i>Sympetrum uniforme</i> (Selys)					○	○	
Blattaria							
<i>Blattella germanica</i> (Linne)						○	
<i>Blattella nipponica</i> Asahina					○	○	
<i>Periplaneta fuliginosa</i> (Waterhouse)						○	
Mantodea							
<i>Mantis religiosa</i> (Linne)						○	○
<i>Statilia maculata</i> (Thunberg)	○	○	○		○		○
<i>Tenodera angustipennis</i> Saussure					○		○
<i>Tenodera aridifolia</i> (Stoll)	○	○	○				○
Isoptera							
<i>Reticulitermes speratus</i> Kiesenwetter						○	
Dermaptera							
<i>Anechura japonica</i> (Bormans)					○		
<i>Anisolabis maritima</i> (Bonelli)		○					○
<i>Euborellia annulipes</i> (Lucas)						○	
<i>Gonolabis marginalis</i> (Dohrn)						○	
<i>Labidura riparia japonica</i> (de Haan)						○	
<i>Metabellia curvicauda</i> (Motschulsky)						○	
<i>Timomenus komarov</i> (Semenov)					○		
Orthoptera							
<i>Acrida cinerea cinerea</i> (Thunberg)	○	○	○	○	○	○	○
<i>Aiolopus thalassinus tamulus</i> (Fabricius)						○	
<i>Anapodisma beybienkoi</i> Rentz et Miller			○		○	○	
<i>Arcyptera coreana</i> Shiraki						○	
<i>Atlanticus brunneri</i> (Le Guillo)						○	
<i>Atractomorpha lata</i> (Motschulsky)	○	○	○	○	○	○	○
<i>Calliptamus abbreviatus</i> Ikonnikov	○		○				○
<i>Celes skalozubovi akitanus</i> Shiraki						○	
<i>Chorthippus brunneus</i> (Thunberg)					○		
<i>Conocephalus chinensis</i> (Redtenbacher)	○	○					○
<i>Conocephalus gladiatus</i> (Redtenbacher)	○	○				○	○
<i>Conocephalus japonicus</i> (Walker)						○	
<i>Conocephalus maculatus</i> (Le Guillo)	○		○			○	○
<i>Dianemobius csikii</i> (Bolivar)			○				
<i>Dianemobius furumagiensis</i> (Ohmachi et Furukawa)	○						
<i>Diestrammena asynamora</i> (Adelung)	○					○	○
<i>Diestrammena coreana</i> (Yamasaki)							○
<i>Ducetia japonica</i> (Thunberg)	○		○		○	○	○
<i>Elimaea fallax</i> (Linne)			○			○	
<i>Euchorthippus unicolor</i> Ikonnikov						○	
<i>Euconocephalus varius</i> (Walker)							○
<i>Euparattix insularis</i> Bey-Bienko						○	
<i>Euscirtus japonicus</i> Shiraki						○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Gampsocleis sedakovi abscura</i> (Matsumura et Shiraki)						○	
<i>Gampsocleis ussuriensis</i> Adelung	○	○	○				○
<i>Gastrimargus marmoratus</i> (Thunberg)					○	○	○
<i>Gonista bicolor</i> (de Haan)						○	○
<i>Gryllotalpa orientalis</i> (Burmeister)	○	○	○			○	○
<i>Hexacentrus japonicus</i> Karny	○		○				○
<i>Hexacentrus unicolor</i> Serville				○		○	
<i>Holochlora longifissa</i> Matsumura et Shiraki		○					
<i>Kuwayamaea sapporensis</i> Brunner						○	
<i>Locusta migratoria</i> (Linn)					○	○	
<i>Loxoblemmus arietulus</i> Saussure	○		○	○		○	○
<i>Loxoblemmus doenitzi</i> Stein		○				○	
<i>Metrioptera</i> (<i>Metrioptera</i>) <i>bonneti</i> (Bolivar)						○	
<i>Mongolotettix japonicus japonicus</i> (Bolivar)	○						
<i>Oecanthus euryelytra</i> Ichikawa			○				
<i>Oecanthus indicus</i> Saussure		○	○			○	○
<i>Oedaleus infernalis</i> Saussure	○	○	○	○	○	○	○
<i>Ognevia longipennis</i> Shiraki						○	
<i>Ornebius kanetataki</i> (Matsumura)							○
<i>Oxya chinensis sinuosa</i> Mistshenko	○		○				○
<i>Oxya japonica japonica</i> (Thunberg)				○		○	
<i>Parapteronemobius sazanami</i> Furukawa	○		○				○
<i>Paratlanticus ussuriensis</i> (Uvarov)						○	
<i>Paratrigonidium bifasciatum</i> Shiraki	○	○	○			○	○
<i>Phaneroptera falcata</i> (Poda)				○	○	○	○
<i>Phaneroptera nigroantennata</i> Brunner	○	○	○	○	○	○	○
<i>Polionemobius mikado</i> (Shiraki)	○	○					○
<i>Ruspolia jezoensis</i> (Matsumura et Shiraki)	○		○				○
<i>Ruspolia lineosa</i> (Walker)	○				○	○	○
<i>Shirakiacris shirakii</i> (Bolivar)	○	○	○	○	○	○	○
<i>Teleogryllus emma</i> (Ohmachi et Matsumura)	○	○	○	○	○	○	○
<i>Tetrix japonica</i> (Bolivar)	○			○	○	○	○
<i>Tettigonia dolichoptera</i> Mori		○					
<i>Tettigonia viridissima</i> (Thunberg)						○	
<i>Trilophidia annulata</i> Thunberg	○	○	○	○	○		○
<i>Velarifictorus aspersus</i> (Walker)		○					
<i>Velarifictorus mikado</i> (Saussure)	○	○	○	○			○
Hemiptera							
<i>Acanthocoris sordidus</i> (Thunberg)		○				○	
<i>Acanthosoma labiduroides</i> Jakovlev						○	
<i>Adelphocoris demissus</i> Horvath							○
<i>Adelphocoris lineolatus</i> (Goeze)	○					○	
<i>Adelphocoris piceosetosus</i> Kulik	○						
<i>Adelphocoris suturalis</i> (Jakovlev)		○	○		○		○
<i>Adelphocoris triannulatus</i> (Stal)				○	○		
<i>Aelia fieberi</i> Scott	○		○		○		
<i>Alloeotomus chinensis</i> Reuter		○					
<i>Alloeotomus simplus</i> (Uhler)			○				
<i>Anoplocnemis dallasi</i> Kiritshenko	○		○			○	
<i>Aquarius paludum</i> (Fabricius)					○		
<i>Carbula humerigera</i> (Uhler)					○		
<i>Carbula putoni</i> (Jakovlev)				○	○	○	○
<i>Charagochilus angusticollis</i> Linnavuori		○			○		
<i>Chauliops fallax</i> Scott	○			○	○		○
<i>Cletus punctiger</i> (Kiritshenko)				○	○		
<i>Cletus schmidtii</i> Kiritshenko	○	○	○	○	○	○	
<i>Cletus trigonus</i> (Thunberg)	○				○	○	
<i>Coptosoma bifarium</i> Montandon	○		○		○	○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Coptosoma parvipictum</i> Montandon				○			
<i>Cydnocoris russatus</i> Stal					○		
<i>Deraeocoris (Camptobrochis) onphoriensis</i> Josifov		○				○	
<i>Deraeocoris (Deraeocoris) ater</i> (Jakovlev)						○	
<i>Dolycoris baccarum</i> (Linne)	○	○	○	○	○	○	
<i>Ectmetopterus micantulus</i> (Horvath)	○			○	○		
<i>Eurydema dominulus</i> (Scopoli)	○						
<i>Eurydema gebleri</i> Kolenati		○	○		○	○	○
<i>Eurydema rugosa</i> Motschulsky					○		
<i>Eurygaster testudinaria</i> (Geoffroy)		○			○		
<i>Eurystylus luteus</i> Hsiao		○					
<i>Eysarcoris aeneus</i> (Scopoli)	○		○	○		○	
<i>Eysarcoris ventralis</i> (Westwood)		○	○		○		
<i>Geocoris (Piocoris) varius</i> (Uhler)	○	○		○	○	○	
<i>Gerris (Gerris) latiabdominis</i> Miyamoto		○				○	
<i>Gorpis (Oronabis) brevilineatus</i> (Scott)					○		
<i>Halticus comitans</i> Josifov et Kerzhner			○	○	○		
<i>Halyomorpha halys</i> (Stal)	○	○			○		○
<i>Himacerus (Himacerus) apterus</i> (Fabricius)		○					
<i>Homalogonia obtusa</i> (Walker)			○		○		
<i>Homoeocerus dilatatus</i> Horvath	○	○	○	○	○		○
<i>Hoplitocoris (Pseudenicocephalus) lewisi</i> (Distant)					○		
<i>Hygia (Colpura) lativentris</i> (Motschulsky)		○	○	○	○	○	
<i>Hypogeocoris itonis</i> (Horvth)	○					○	
<i>Isyndus obscurus</i> (Dallas)					○		
<i>Lethocerus deyrollei</i> (Vuillefroy)		○					
<i>Liorhyssus hyalinus</i> (Fabricius)					○		○
<i>Lygocoris (Apolygus) limbatus</i> (Falln)					○	○	
<i>Lygocoris (Apolygus) lucorum</i> (Meyer-Dr)	○				○	○	
<i>Lygocoris (Apolygus) pulchellus</i> (Reuter)		○					
<i>Lygocoris (Apolygus) spinolae</i> (Meyer-Dur)		○		○		○	○
<i>Lygocoris (Apolygus) subpulchellus</i> Kerzhner				○			
<i>Macroscytus japonensis</i> Scott		○	○				
<i>Megacopta punctatissima</i> (Montandon)	○						
<i>Melypteryx fuliginosa</i> (Uhler)		○		○			
<i>Menida musiva</i> (Jakovlev)					○		
<i>Menida scotti</i> Puton						○	
<i>Menida violacea</i> Motschulsky					○		
<i>Muljarus japonicus</i> (Vuillefroy)						○	
<i>Neolethaeus dallasi</i> (Scott)	○	○					
<i>Nepa hoffmanni</i> Esaki						○	
<i>Nezara antennata</i> Scott					○	○	
<i>Nysius (Nysius) plebejus</i> Distant	○	○	○	○	○	○	○
<i>Oncocephalus assimilis</i> Reuter		○					
<i>Orthocephalus funestus</i> Jakovlev				○	○		
<i>Pachygrontha antennata</i> (Uhler)		○	○	○	○	○	
<i>Palomena angulosa</i> (Motschulsky)	○					○	
<i>Panaorus albomaculatus</i> (Scott)						○	
<i>Panaorus csikii</i> (Horvth)		○	○				
<i>Panaorus japonicus</i> (Stal)					○		
<i>Paromius exiguus</i> (Distant)		○			○	○	
<i>Picromerus lewisi</i> Scott			○				
<i>Pilophorus typicus</i> (Distant)				○			
<i>Pinthaeus sanguinipes</i> (Fabricius)					○		
<i>Plagiognathus (Plagiognathus) amurensis</i> Reuter		○		○			
<i>Plagiognathus (Plagiognathus) yomogi</i> Miyamoto	○						
<i>Plagiognathus (Poliopterus) albipennis</i> (Falln)					○		
<i>Plautia stali</i> Scott		○			○	○	○
<i>Polymerus (Poeciloscytus) cognatus</i> (Fieber)		○					

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Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Polymerus (Polymerus) pekinensis</i> Horvth		○					○
<i>Probosciodocoris varicornis</i> (Jakovlev)					○	○	
<i>Pyrrhocoris sibiricus</i> Kuschakewitsch	○	○		○	○	○	
<i>Pyrrhocoris sinuaticollis</i> Reuter		○					
<i>Ranatra chinensis</i> Mayr		○					
<i>Rhopalus (Aeschyntelus) maculatus</i> (Fieber)	○	○	○			○	○
<i>Rhopalus (Aeschyntelus) sapporensis</i> (Matsumura)		○	○	○	○		○
<i>Riptortus clavatus</i> (Thunberg)		○		○	○	○	
<i>Sastragala esakii</i> Hasegawa					○		
<i>Sigara (Tropocorixa) substriata</i> (Uhler)					○		
<i>Sphedanolestes impressicollis</i> (Stal)	○	○	○	○	○		
<i>Stenodema (Brachystira) calcarata</i> (Falln)		○					
<i>Stenodema (Stenodema) rubrinervis</i> Horvth	○				○		
<i>Stenotus rubrovittatus</i> (Matsumura)		○		○			
<i>Stephanitis pyrioides</i> (Scott)					○		
<i>Stictopleurus crassicornis</i> (Linn)		○	○			○	○
<i>Stictopleurus punctatonervosus minutus</i> Blote	○		○	○	○	○	○
<i>Togo hemipterus</i> (Scott)					○		
<i>Trigonotylus coelestialium</i> (Kirkaldy)				○			○
<i>Urostylis annulicornis</i> Scott		○			○		
<i>Urostylis lateralis</i> Walker		○				○	
<i>Urostylis westwoodi</i> Scott					○		
<i>Velinus nodipes</i> (Uhler)	○						
<i>Yemma exilis</i> Horvath				○	○		
Homoptera							
<i>Aphrophora maritima</i> (Matsumura)		○			○	○	
<i>Austroasca (Austroasca) vittata</i> (Lethierry)					○		
<i>Bothrogonia japonica</i> Ishihara	○	○	○	○	○	○	○
<i>Butragulus flavipes</i> (Uhler)		○					
<i>Cicadella viridis</i> (Linne)		○		○	○		
<i>Dryodurgades lamellaris</i> Vilbaste				○			
<i>Eoscartopsis assimilis</i> (Uhler)				○	○	○	
<i>Gargara genistae</i> (Fabricius)	○						
<i>Graptopsaltria nigrofuscata</i> (Motschulsky)		○			○		
<i>Kolla atramentaria</i> (Motschulsky)					○		
<i>Laodelphax striatellus</i> (Fallen)				○			
<i>Machaerotypus sibiricus</i> (Lethierry)					○	○	
<i>Macrosiphoniella (Phalangomyzus) grandicauda</i> Takahashi et Moritsu				○			
<i>Macrosiphoniella yomogifoliae</i> Shinji				○			
<i>Macrosiphum clematifoliae</i> Shinji				○			
<i>Meimuna mongolica</i> (Distant)					○		
<i>Meimuna opalifera</i> (Walker)		○			○		
<i>Mileewa (Mileewa) dorsimaculata</i> (Melichar)					○		
<i>Mogannia hebes</i> (Walker)	○						
<i>Nakaharamus sagittarius</i> Kwon et Lee					○		
<i>Oncotympana fuscata</i> (Distant)		○			○		
<i>Orosanga japonica</i> (Melichar)				○			
<i>Orthopagus humulifer</i> Uhler				○			
<i>Platypleura kaempferi</i> (Fabricius)		○	○		○		
<i>Ricania taeniata</i> Stal		○					
<i>Sitobion avenae</i> (Fabricius)				○			
<i>Suisha coreana</i> (Matsumura)		○			○		
<i>Uroleucon formosanum</i> (Takahashi)				○			
Neuroptera							
<i>Chrysopa (Chrysopa) pallens</i> (Okamoto)						○	
<i>Chrysoperla carnea</i> (Okamoto)						○	
<i>Distoleon nigricans</i> (Okamoto)						○	
<i>Eumantispa harmandi</i> (Navas)					○		

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Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Hagenomyia micans</i> (MacLachlan)		○				○	
<i>Hybris subjacens</i> (Walker)		○					
Coleoptera							
<i>Acythopeus parabasimaculatus</i> Morimoto et Lee				○	○		
<i>Adoretus tenuimaculatus</i> Waterhouse		○			○	○	
<i>Aeoloderma agnata</i> (Candze)						○	
<i>Agapanthia pilicornis</i> (Fabricius)		○			○	○	○
<i>Agelastica coerulea</i> Baly		○	○				
<i>Agrilus cyaneoniger melanopterus</i> Solsky					○		
<i>Agrypnus binodulus coreanus</i> Kishii						○	
<i>Agrypnus scrofa</i> Gyllenhal						○	
<i>Altica viridicyanea</i> (Baly)					○		
<i>Amara (Amara) ussuriensis</i> Lutshnik						○	
<i>Anatis halonis</i> Lewis					○		
<i>Ancylopus pictus asiaticus</i> Strohecker				○	○	○	
<i>Anisodactylus punctatipennis</i> Morawitz					○	○	
<i>Anisosticta kobensis</i> Lewis						○	
<i>Anomala (Idiocnema) aulax</i> Wiedemann					○	○	
<i>Anomala albopilosa</i> Hope			○				
<i>Anomala chamaeleon</i> Fairmaire						○	
<i>Anomala daimiana</i> Harold					○		
<i>Anomala luculenta</i> Erichson				○			
<i>Anthonomus bisignifer</i> Schenkling						○	
<i>Apion (Piezotrachelus) japonicum</i> Roelofs					○		
<i>Apion (Pseudopiezotrachelus) collare</i> Schilsky				○	○		
<i>Apoderus (Apoderus) jekelii</i> (Roelofs)					○		
<i>Aporotritoma consobrina</i> (Lewis)				○			
<i>Aspidobyctiscus lacunipennis</i> (Jekel)							○
<i>Aulacophora nigripennis</i> Motschulsky					○		
<i>Balanobius (Toptaria) roelofsi</i> (Heller)					○		
<i>Baris orientalis</i> Roelofs					○		
<i>Basamus tsushimensis kompanecevi</i> Kaszab et G.Medvedev				○	○		
<i>Basilepta fulvipes</i> (Motschulsky)		○		○	○	○	
<i>Berosus (Enoplurus) lewisius</i> Sharp					○	○	
<i>Blitopertha conspurcata</i> Kolbe	○					○	
<i>Blitopertha pallidipennis</i> (Reitter)					○		
<i>Brachinus stenoderus</i> Bates		○					
<i>Bradycellus (Lioholus) laeticolor</i> Bates						○	
<i>Calleida (Callidiola) lepida</i> Redtenbacher					○	○	
<i>Callosobruchus chinensis</i> (Linne)				○			
<i>Calosoma maximowiczii</i> (Morawitz)					○		
<i>Calvia (Anisocalvia) muiri</i> (Timberlake)					○		
<i>Cassida (Cassida) nebulosa</i> Linne				○			
<i>Cassida (Cassida) rubiginosa</i> Muller					○	○	
<i>Cassida (Mionycha) concha</i> Monros						○	
<i>Ceropia inducta</i> (Wiedemann)				○	○		
<i>Ceutorhynchus shaowuensis</i> (Voss)				○			
<i>Chaetocnema (Tlanoma) concinna</i> (Marshall)				○			
<i>Chiagosinus vittiger</i> (Heyden)			○				
<i>Chilocorus kuwanae</i> Silvestri					○		
<i>Chlaenius (Ilaenichus) naeviger</i> Morawitz					○		
<i>Chlaenius (Ilaenichus) posticalis</i> Motschulsky					○	○	
<i>Chlaenius (Pachydinodes) pictus</i> Chaudoir		○					
<i>Chrysolina aurichalcea</i> (Mannerheim)					○		
<i>Chrysomela (Chrysomela) populi</i> (Motschulsky)				○			
<i>Cicindela (Cicindela) gemmata gemmata</i> Faldermann						○	
<i>Cicindela (Cicindela) transbaicalica japonensis</i> Chaudoir						○	
<i>Cicindela (Eugrapha) elisae koreanica</i> Mandl		○				○	
<i>Cicindela (Sophiodela) chinensis flammifera</i> Horn						○	○

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Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Coccinella (Coccinella) septempunctat</i> Linne		○	○	○	○	○	
<i>Coelambus chinensis</i> Sharp					○	○	
<i>Colasposoma dauricum</i> Mannerheim		○				○	
<i>Copris tripartitus</i> Waterhouse		○					
<i>Corticicara gibbosa</i> (Herbst)					○		
<i>Corymbia rubra</i> (Linne)	○	○	○	○	○		○
<i>Cryptocephalus confusus</i> Heikertinger						○	
<i>Cryptocephalus fulvus</i> Baly						○	
<i>Cryptocephalus koltzei</i> Weise		○	○				
<i>Curculio ochrofasciatus</i> Morimoto		○					
<i>Curculio sikkimensis</i> (Heller)					○		
<i>Cynotrachelus coloratus</i> (Faust)					○		
<i>Cyrtepidomus castaneus</i> (Roelofs)						○	
<i>Dacne picta</i> Crotch				○	○		
<i>Dactylispa angulosa</i> (Solsky)		○		○	○		
<i>Derops coreanus</i> (Watanabe)						○	
<i>Dolichus halensis</i> (Schaller)		○					
<i>Ectinohoplia rufipes</i> (Motschulsky)						○	
<i>Enaptorrhinus granulatus</i> Pascoe					○	○	○
<i>Encyalesthus violaceipennis</i> (Marseul)		○			○		
<i>Enochrus (Holcophilydrus) simulans</i> (Sharp)						○	
<i>Epicauta chinensis taishoensis</i> (Lewis)						○	
<i>Epilachna quadricollis</i> (Dieke)				○			
<i>Episcapha fortunii</i> Crotch				○	○		
<i>Eumyllocerus gratosus</i> Sharp						○	
<i>Exocentrus lineatus</i> Reitter						○	
<i>Galerucella grisescens</i> (Joannis)				○	○	○	
<i>Galerucella nipponensis</i> (Laboissiere)		○					
<i>Gametis jucunda</i> Faldermann						○	
<i>Gastrophysa atrocyanea</i> Motschulsky				○			
<i>Gastroserica herzi</i> (Heyden)						○	
<i>Glycyphana fulvistemma</i> Motschulsky				○			
<i>Gonocephalum sexuale</i> (Marseul)					○		
<i>Guignotus japonicus</i> (Sharp)						○	
<i>Haliplus (Liaphlus) ovalis</i> Sharp						○	
<i>Harmonia axyridis</i> (Pallas)		○	○		○	○	
<i>Harmonia yedoensis</i> (Takizawa)						○	
<i>Harpalus (Cephalomorphus) capito</i> Morawitz		○			○		
<i>Harpalus (Harpalus) chalcatus</i> Bates		○				○	
<i>Harpalus (Pseudoophonus) roninus</i> Bates		○					
<i>Henosepilachna vigintioctomaculata</i> (Motschulsky)		○	○	○		○	
<i>Heptophylla picea</i> Motschulsky		○					
<i>Hippodamia (Hippodamia) tredecimpunctata</i> (Linne)						○	
<i>Holotrichia diomphalia</i> (Bates)						○	
<i>Holotrichia kiotoensis</i> Brenske			○				
<i>Holotrichia morosa</i> Waterhouse		○			○	○	
<i>Holotrichia niponensis</i> (Lewis)					○		
<i>Hydaticus (Hydaticus) grammicus</i> Germar						○	
<i>Hydrochara affinis</i> (Sharp)					○		
<i>Hydrophilus accuminatus</i> Motschulsky		○		○			
<i>Hydrophilus bilineatus cashimirensis</i> Redtenbacher		○			○		
<i>Hyphydrus japonicus</i> Sharp						○	
<i>Ilybius apicalis</i> Sharp					○		
<i>Laccophilus difficilis</i> Sharp						○	
<i>Lamiomimus gottschei</i> Kolbe					○		
<i>Larinus latissimus</i> Roelofs					○		
<i>Lema (Lema) concinnipennis</i> Baly		○		○	○	○	
<i>Lema (Lema) decempunctata</i> Gebler				○			
<i>Lema (Lema) diversa</i> Baly		○		○	○		

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Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Lema (Petauristes) fortunei</i> Baly						○	
<i>Linaeidea adamsi</i> (Baly)					○		
<i>Linaeidea aenea</i> (Linne)							○
<i>Lixus acutipennis</i> (Roelofs)					○		
<i>Lixus imperessiventris</i> Roelofs						○	
<i>Macrochlaenites costiger</i> (Chaudoir)		○			○		
<i>Macrodorcas rectus rectus</i> Y.Kurosawa				○			
<i>Malachius prolongatus</i> Motschulsky			○				
<i>Maladera cariniceps</i> (Moser)					○		
<i>Maladera renardi</i> (Ballion)						○	
<i>Maladera verticalis</i> (Fairmaire)						○	
<i>Mecorhis ursulus</i> (Roelofs)					○		
<i>Medythia nigrobilineata</i> (Motschulsky)				○	○	○	
<i>Megasemum quadricostulatum</i> Kraatz					○		
<i>Megopis sinica</i> (White)		○					
<i>Melanotus (Spheniscosomus) cete</i> Candze					○		
<i>Mesalcidodes trifidus</i> (Pascoe)					○		
<i>Mesosa hirsuta</i> Bates					○		
<i>Mimela fusania</i> Bates			○			○	
<i>Mimela holosericea</i> (Fabricius)		○					
<i>Mimela splendens</i> Gyllenhal		○			○	○	
<i>Mimela testaceipes</i> Motschulsky					○	○	
<i>Moechotypa diphyis</i> (Pascoe)			○		○		
<i>Monolepta quadriguttata</i> (Motschulsky)					○		
<i>Monolepta shirozui</i> Kimoto					○		
<i>Mordellistena comes</i> Marseul					○		
<i>Myllocerus fumosus</i> (Faust)					○		
<i>Myllocerus nigromaculatus</i> Roelofs						○	
<i>Myllocerus nipponensis</i> Zumpt					○		
<i>Nebria (Paranebria) livida angulata</i> Banninger						○	
<i>Necrodes asiaticus</i> Portevin		○					
<i>Nonarthra cyanea</i> Baly					○		
<i>Nupserha marginella</i> (Bates)						○	
<i>Oberea depressa</i> Motschulsky				○			
<i>Ochtheophilum densipenne</i> (Sharp)			○				
<i>Oedemeronia lucidicollis</i> (Motschulsky)					○		
<i>Omophron (Omophron) aequalis jacobsoni</i> Semenov						○	
<i>Onthophagus (Gibbonthophagus) atripennis</i> Kolbe						○	
<i>Onthophagus (Strandius) lenzii</i> Harold		○					
<i>Ophraella communis</i> LeSage		○					
<i>Orchestes japonicus</i> Hustache					○		
<i>Osorius taurus</i> Sharp		○					
<i>Paederus (Paederus) parallelus</i> Weise						○	
<i>Pagria signata</i> (Motschulsky)				○	○	○	
<i>Pallodes umbratilis</i> Reitter					○		
<i>Paracynotrachelus longiceps</i> (Motschulsky)				○		○	
<i>Pectocera fortunei</i> (Candeze)				○		○	
<i>Peltodytes sinensis</i> (Hope)					○		
<i>Pheropsophus javanus</i> (Dejean)		○					
<i>Philonthus (Philonthus) cunctator</i> Sharp		○					
<i>Phygasia fulvipennis</i> (Baly)			○			○	
<i>Phyllotreta striolata</i> (Fabricius)					○		
<i>Physosmaragdina nigrifrons</i> (Hope)				○	○	○	○
<i>Phytoecia rufiventris</i> Gautier			○			○	
<i>Plagiodera versicolora</i> (Laicharting)		○			○		
<i>Platydemus nigroaeneus</i> Motschulsky				○	○		
<i>Platydracus paganus</i> (Sharp)		○				○	
<i>Podabrus longissimus</i> Pic		○	○				
<i>Polyzonus fasciatus</i> (Fabricius)	○						

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Popillia flavosellata</i> Fairemaire					○		
<i>Popillia japonica</i> Newmann	○						
<i>Popillia mutans</i> Mewmann		○	○		○		
<i>Popillia quadriguttata</i> (Fabricius)					○		
<i>Potaninia cyrtoides</i> (Jacoby)					○		
<i>Prionus insularis</i> Motschulsky						○	
<i>Propylea japonica</i> (Thunberg)	○	○	○	○	○	○	
<i>Prosopocoilus inclinatus inclinatus</i> (Motschulsky)		○		○	○		
<i>Pseudocneorhinus setosus</i> Roelofs				○	○		
<i>Pseudopyrochroa rufula</i> (Motschulsky)					○		
<i>Pseudotorynorrhina japonica</i> Hope		○					
<i>Ptomascopus morio</i> Kraatz						○	
<i>Rhantus (Rhantus) pulverosus</i> (Stephens)					○	○	
<i>Rhaphuma gracilipes</i> (Faldermann)						○	
<i>Rodolia limbata</i> (Motschulsky)						○	
<i>Scarites (Parallelomorphus) acutidens</i> Moore						○	
<i>Scirtes japonicus</i> Kiesenwetter					○		
<i>Scymnus (Neopullus) babai</i> Sasaji				○	○	○	
<i>Scymnus (Neopullus) hoffmanni</i> Weise						○	
<i>Scymnus (Scymnus) tsushimaensis</i> Sasaji				○	○	○	
<i>Scymnus yamato</i> Kamiya						○	
<i>Serrognathus platymelus castanicolor</i> Motschulsky		○		○	○		
<i>Shirahoshizo insidiosus</i> (Roelofs)					○		
<i>Silpha perforata perforata</i> Gebler		○					
<i>Sipalinus gigas gigas</i> (Fabricius)							○
<i>Soronia fracta</i> Reitter		○					
<i>Spilota plagicollis</i> Fairmaire						○	
<i>Stricticomus valgipes</i> (Marseul)					○		
<i>Thlaspidia cribrata</i> (Boheman)		○					
<i>Trachys minuta</i> (Linne)					○		
<i>Trichius succinctus</i> (Pallas)	○	○	○			○	
<i>Trigonognatha coreana</i> (Tschitscherine)					○		
<i>Trigonotoma lewisii</i> Bates		○			○		
<i>Xanthochroa luteipennis</i> Marseul					○		
<i>Zacladus fallax</i> (Boheman)					○		
<i>Zonitis japonica</i> Pic					○		
Hymenoptera							
<i>Aleiodes (Aleiodes) dispar</i> (Curtis)				○	○		
<i>Aleiodes (Neorhogas) territatus</i> Papp				○	○		
<i>Ammophila sabulosa infesta</i> Smith	○			○			
<i>Anterhynchium flavomarginatum</i> Smith		○					○
<i>Anthophora zonata</i> Linne				○			
<i>Aphaenogaster famelica</i> (Smith)		○					
<i>Aphaenogaster smythiesi japonica</i> Forel						○	
<i>Apis mellifera</i> Linne				○	○	○	
<i>Ascogaster albitarsus</i> Reinhard					○		
<i>Ascogaster varipes</i> Wesmael				○			
<i>Bombus anachoreta</i> Skorikov		○					
<i>Bombus ignitus</i> Smith					○	○	
<i>Bombus speciosus</i> (Smith)		○					
<i>Bracon onukii</i> Watanabe						○	
<i>Callajoppa pepsoides</i> (Smith)						○	
<i>Camponotus (Camponotus) japonicus</i> Mayr	○	○	○		○		○
<i>Camponotus (Myrmentoma) quadrinotatus</i> Forel					○		
<i>Campsomeris (Campsomeris) annulata</i> Saussure et Sichel				○			
<i>Campsomeris (Megacampsomeris) prismatica</i> Smith		○			○		
<i>Chalicodoma sculpturalis</i> Smith		○					
<i>Colletes collaris</i> Dours		○	○			○	
<i>Crematogaster (Crematogaster) brunnea teranishii</i> Santschi						○	○

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Crematogaster (Crematogaster) laboriosa</i> Smith	○	○	○				○
<i>Crematogaster (Crematogaster) matsumurai</i> Forel						○	
<i>Crematogaster (Orthocrema) osakensis</i> Forel	○					○	
<i>Dictyonotus purpurascens</i> (Smith)	○		○				
<i>Doryctes fulviceps</i> Reinhard				○			
<i>Eumenes architectus</i> Smith					○		
<i>Eumenes pomiformis</i> Fabricius		○	○		○	○	○
<i>Eumenes punctatus</i> Saussure		○					
<i>Euodynerus dantici</i> Rossi		○	○				○
<i>Euodynerus quadrifasciatus</i> Fabricius				○			
<i>Formica (Serviformica) japonica</i> Motschulsky	○	○	○			○	○
<i>Glyptapanteles liparidis</i> (Bouche)						○	
<i>Hypoponera gleadowi</i> Forel	○	○	○				○
<i>Isodontia nigellus</i> Smith		○			○		
<i>Lasius (Dendrolasius) spathopus</i> Wheeler		○					
<i>Lasius (Lasius) japonicus</i> (Linn)	○	○	○			○	○
<i>Messor aciculatus</i> (Smith)		○					
<i>Meteorus gyrator</i> (Thunberg)					○		
<i>Meteorus ictericus</i> (Nees)				○	○		
<i>Meteorus pulchricornis</i> (Wesmael)				○			
<i>Metopius (Ceratopius) dissectorius</i> Panzer					○		
<i>Netelia (Netelia) testacea</i> (Gravenhorst)					○		
<i>Orancistrocerus drewseni</i> (Saussure)	○	○		○			
<i>Oreumenes decoratus</i> (Smith)					○		○
<i>Pachychondyla chinensis</i> (Emery)	○	○	○			○	○
<i>Pachychondyla javana</i> (Mayr)		○				○	
<i>Paracyphononyx alienus</i> (Smith)			○				
<i>Parapolybia indica</i> (Saussure)					○		
<i>Parapolybia varia</i> (Fabricius)		○			○	○	
<i>Paratrechina flavipes</i> (Smith)	○	○	○			○	○
<i>Pheidole fervida</i> (Smith)	○	○	○			○	○
<i>Plagiolepis mandzurica</i> Ruzsky						○	
<i>Polistes jadwigae jadwigae</i> Dalla Torre		○				○	
<i>Polistes japonicus japonicus</i> Saussure		○			○	○	
<i>Polistes mandarinus</i> Saussure et Geer				○		○	
<i>Polistes snelleni</i> Saussure		○	○	○			
<i>Polyrhachis (Polyrhachis) lamellidens</i> Smith		○			○	○	○
<i>Pristomyrmex punctatus</i> F. Smith	○	○				○	○
<i>Protichneumon superomediae scopus</i> (Uchida)	○						
<i>Sceliphron inflexum</i> Sickmann		○	○				
<i>Scolia (Discolia) oculata</i> Matsumura							○
<i>Scolia (Scolia) histrionica</i> (Fabricius)		○			○		
<i>Streblocera villosa</i> Papp				○			
<i>Strumigenys lewisi</i> Cameron	○						
<i>Tetramorium tsushimae</i> Emery	○	○	○		○	○	○
<i>Urocerus japonicus</i> (Smith)	○						
<i>Vespa crabro flavofasciata</i> Cameron		○	○			○	
<i>Vespa ducalis</i> Smith					○	○	
<i>Vespa mandarinia</i> Cameron		○			○		
<i>Vespa simillima simillima</i> Smith						○	
<i>Vespula flaviceps lewisii</i> (Cameron)	○	○	○				
<i>Vollenhovia emeryi chosonica</i> Wheeler	○						
<i>Xylocopa appendiculata circumvolans</i> Smith	○	○		○		○	○
<i>Zelee albiditarsus</i> Curtis				○			
Diptera							
<i>Allobaccha apicalis</i> (Loew)	○						○
<i>Allograpta balteata</i> (de Geer)	○	○	○	○	○	○	○
<i>Allograpta javana</i> (Wiedemann)							○
<i>Anthrax yamashiroensis</i> Matsumura						○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Baccha maculata</i> Walker	○	○		○		○	
<i>Bombylius major</i> Linn					○	○	
<i>Campiglossa hirayamae</i> (Matsumura)					○	○	
<i>Chrysotoxum festivum</i> (Linne)				○			
<i>Craspedometopon frontale</i> Kertész					○		
<i>Cylindromyia</i> (<i>Cylindromyia</i>) <i>brassicaria</i> (Fabricius)				○			
<i>Dacus</i> (<i>Zeugodacus</i>) <i>scutellatus</i> Hendel					○		
<i>Dasysyrphus bilineatus</i> (Matsumura)					○		
<i>Dolichopus nitidus</i> Falln					○		
<i>Eristalinus</i> (<i>Lathyrrophthalmus</i>) <i>tarsalis</i> (Macquart)				○			
<i>Eristalis</i> (<i>Eoseristalis</i>) <i>arborum</i> (Linn)					○		
<i>Eristalis</i> (<i>Eoseristalis</i>) <i>cerealis</i> Fabricius		○		○	○	○	○
<i>Eristalis</i> (<i>Eristalis</i>) <i>tenax</i> (Linne)		○	○	○	○	○	
<i>Eumerus japonicus</i> Matsumura			○				
<i>Fucellia apicalis</i> Kertész			○				
<i>Helicophagella melanura</i> (Fallen)						○	
<i>Helophilus</i> (<i>Helophilus</i>) <i>virgatus</i> Coquillett					○		
<i>Homoneura euaresta</i> (Coquillett)			○	○			
<i>Homoneura spinicauda</i> Sasakawa et Ikeuchi					○		
<i>Lucilia caesar</i> (Linne)						○	
<i>Lucilia illustris</i> (Meigen)				○	○		
<i>Melanostoma mellinum</i> (Linn)	○		○		○	○	
<i>Mesorhaga nebulosa</i> (Matsumura)			○			○	
<i>Metasyrphus frequens</i> Matsumura		○					
<i>Musca domestica</i> (Linne)				○			
<i>Neoitamus angusticornis</i> (Loew)						○	
<i>Obolodiplosis robiniae</i> (Haldeman)				○			
<i>Paragus coreanus</i> Shiraki					○	○	
<i>Peleteria</i> (<i>Hemipeleteria</i>) <i>semiglabra</i> (Zimin)				○			
<i>Phaenicia sericata</i> (Meigen)						○	
<i>Phytomia zonata</i> (Fabricius)		○	○				
<i>Promachus yesonicus</i> Bigot		○		○	○	○	
<i>Ptecticus tenebrifer</i> (Walker)	○		○	○	○	○	○
<i>Rivellia mandschurica</i> Hennig				○			
<i>Sepsis monostigma</i> Thomson				○	○		
<i>Solva maculata</i> (Bremer)				○			
<i>Sphaerophoria menthastri</i> (Linne)	○	○	○	○	○	○	○
<i>Spilomyia suzukii</i> Matsumura						○	
<i>Stomorphina obsoleta</i> (Wiedemann)				○	○		
<i>Syrphus torvus</i> Osten-Sacken				○	○		
<i>Systropus suzukii</i> Matsumura	○	○	○	○			
<i>Tabanus chrysurus</i> Loew	○			○	○	○	
<i>Tachina</i> (<i>Eudoromyia</i>) <i>nupta</i> (Rondani)						○	
<i>Trupanea convergens</i> (Hering)				○			
<i>Volucella nigricans</i> Coquillett			○				
<i>Xylota coquilletti</i> Herve-Bazin	○						
<i>Xyphosia punctigera</i> (Coquillett)							○
Lepidoptera							
<i>Abraxas nipponibia</i> Wehrli					○		
<i>Acanthoplusia agnata</i> (Staudinger)						○	
<i>Acosmeryx naga</i> (Moore)				○			
<i>Acronicta</i> (<i>Plataplecta</i>) <i>pulverosa</i> (Hampson)						○	
<i>Acronicta major</i> (Bremer)		○				○	
<i>Actebia praecurrens</i> (Staudinger)						○	
<i>Actias gnoma</i> (Moore)				○			
<i>Adoxophyes orana</i> (Fischer von Roslerstamm)				○	○		
<i>Adris tyrannus</i> (Guene)		○					
<i>Aeolanthes semiostrina</i> Matsumura				○			
<i>Aeromachus inachus</i> (Mntris)					○		

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Aglaeomorpha histrio</i> (Walker)		○					
<i>Agnidra scabiosa</i> (Butler)					○		
<i>Agrisius fuliginosus</i> Moore		○			○		
<i>Agrius convolvuli</i> (Linn)					○	○	
<i>Agrotera nemoralis</i> (Scopoli)	○			○		○	
<i>Agrotis ipsilon</i> (Hufnagel)					○		
<i>Agrotis tokionis</i> Butler						○	
<i>Alcis angulifera</i> (Butler)						○	
<i>Amata germana</i> (Felder et Felder)	○			○			
<i>Ambulyx japonica</i> (Rothschild)	○			○			
<i>Ambulyx ochracea</i> (Butler)						○	
<i>Ampelophaga rubiginosa</i> Bremer et Grey	○	○		○	○	○	
<i>Amphipoea burrowsi</i> (Warren)						○	
<i>Amphipoea lucens</i> (Freyer)						○	
<i>Amphipoea ussuriensis</i> (Petersen)	○			○		○	
<i>Amphipyra erebina</i> (Butler)						○	
<i>Amphipyra livida</i> (Denis et Schifferrmiller)					○	○	
<i>Amphipyra monolitha</i> Guenee					○	○	
<i>Amphipyra schrenckii</i> (Oberthur)						○	
<i>Ancylis amplimacula</i> (Christoph)				○			
<i>Ancylolomia japonica</i> Zeller	○		○	○			
<i>Angerona prunaria</i> (Hubner)						○	
<i>Anthocharis scolymus</i> Butler						○	
<i>Antigius attilia</i> (Linne)						○	
<i>Antigius butleri</i> Knoch						○	
<i>Apamea aquila</i> (Donzel)						○	
<i>Apatura metis</i> Freyer		○			○		
<i>Apopetelia chlororhynodes</i> (Butler)		○			○	○	
<i>Araschnia burejana</i> Bremer		○			○		
<i>Archanaera aerata</i> (Butler)			○				
<i>Archips breviplicatus</i> (Christoph)						○	
<i>Archips nigricaudatus</i> (Linne)						○	
<i>Archips oporatus</i> (Linn)				○		○	
<i>Arctornis kumatai</i> Inoue	○	○		○			
<i>Arctornis l-nigrum</i> (Miller)		○					
<i>Argymnis paphia</i> (Linne)							○
<i>Argyreus hyperbius</i> (Linn)		○			○		○
<i>Argyronome laodice</i> (Pallas)	○	○	○	○	○	○	○
<i>Argyronome ruslana</i> (Motschulsky)			○		○	○	
<i>Argyrotaenia congruentana</i> (Kennel)				○	○	○	
<i>Arichanna melanaria</i> (Linn)		○	○		○	○	
<i>Aripara indicator</i> Walker	○	○	○	○	○	○	
<i>Aroga mesostrepta</i> (Saunders)				○			
<i>Artogeia canidia</i> (Linne)		○	○	○	○	○	
<i>Artogeia melete</i> (Menetries)	○	○	○	○	○	○	○
<i>Artogeia rapae</i> (Linne)	○	○	○	○	○	○	○
<i>Ascotis selenaria</i> (Denis et Schifferrmiller)						○	
<i>Assara funerella</i> (Ragonot)						○	
<i>Assara pallidella</i> (Yamanaka)						○	
<i>Athetis albisignata</i> (Oberthur)		○				○	○
<i>Athetis cinerascens</i> (Motschulsky)						○	
<i>Athetis lineosa</i> (Moore)						○	
<i>Athetis stellata</i> (Moore)						○	
<i>Atrachea nitens</i> (Butler)						○	
<i>Atrophaneura alcinous</i> (Klug)						○	○
<i>Auaxa sulphurea</i> (Linne)						○	
<i>Axylia putris</i> (Linn)		○			○	○	
<i>Bactra furfurana</i> (Hubner)				○		○	
<i>Biston regalis</i> (Moore)					○		

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Blasticorhinus hoenei</i> Berio		○					
<i>Blenina senex</i> (Butler)					○		
<i>Botyodes diniasalis</i> (Walker)		○			○		
<i>Bradina geminalis</i> Caradja	○			○	○		○
<i>Brevipecten consanguis</i> Leech	○			○	○		
<i>Calamotropha paludella purella</i> (Leech)	○		○	○		○	
<i>Callambulyx tatarinovi</i> (Bremer et Grey)	○			○		○	
<i>Callophrys frivaldszkyi</i> (Lederer)						○	
<i>Callygris compositata</i> (Guenee)		○	○	○	○	○	
<i>Calyptra gruesa</i> (Draudt)					○		
<i>Calyptra thalictri</i> (Borkhausen)		○					
<i>Catocala actaea</i> Felder et Rogenhofer					○	○	
<i>Catocala doerriesi</i> Staudinger			○		○	○	
<i>Catocala dula</i> Bremer	○			○		○	
<i>Catocala duplicata</i> Butler		○	○			○	
<i>Catocala fulminea</i> (Scopoli)			○		○		
<i>Catocala koreana</i> Staudinger					○		
<i>Catocala nagioides</i> Wileman						○	
<i>Catocala patala</i> Felder et Rogenhofer					○		
<i>Catocala praegnax</i> Walker					○		
<i>Catocala streckeri</i> Staudinger				○		○	
<i>Celastrina argiolus</i> (Linne)	○	○	○	○	○	○	○
<i>Chalcosia remota</i> (Walker)		○	○	○	○		
<i>Charema noctescens</i> Moore						○	
<i>Chiasmia defixaria</i> (Walker)		○					
<i>Chiasmia hebesata</i> (Walker)	○			○			
<i>Chibiraga banhaasi</i> (Hering et Hopp)					○	○	
<i>Chilo suppressalis</i> (Walker)	○			○			
<i>Chionarctia nivea</i> (Menetries)	○			○		○	
<i>Chlorissa anadema</i> (Prout)						○	
<i>Chrysorithrum amatum</i> (Bremer et Grey)						○	
<i>Chrysoteuchia atosignata</i> (Zeller)						○	
<i>Cifuna locuples</i> Walker					○		
<i>Clepsia rurinana</i> (Christoph)	○	○		○		○	
<i>Clossiana selene</i> (Schifferrmuller)							○
<i>Clostera anachoreta</i> (Denis et Schifferrmuller)						○	
<i>Cnaphalocrocis mendinalis</i> (Guenee)		○	○	○	○	○	○
<i>Cnethodonta grisea</i> Staudinger	○			○			
<i>Coenonympha oedippus</i> (Fabricius)		○	○	○	○	○	
<i>Colias erate</i> (Esper)	○	○		○	○	○	○
<i>Comibaena delicatior</i> (Warren)					○		
<i>Cortyia grisea</i> (Eversmann)						○	
<i>Corymica specularia</i> (Moore)			○			○	
<i>Cosmia camptostigma</i> (Vieweg)						○	
<i>Cosmia coreana</i> Matsumura	○			○			
<i>Cosmia unicolor</i> (Staudinger)					○		
<i>Cossus arenicolus</i> Staudinger						○	
<i>Cryptolechia malacobyrsa</i> Meyrick	○			○			
<i>Ctenoplusia (Acanthoplusia) agnata</i> (Staudinger)		○					
<i>Ctenoplusia albostrata</i> (Bremer et Grey)		○					
<i>Culcula panterinaria</i> (Bremer et Grey)				○	○	○	
<i>Cusiala stipitaria</i> (Oberthur)				○			
<i>Cymatophoropsis trimaculata</i> (Bremer)						○	
<i>Cyntia cardui</i> (Linne)	○	○	○	○	○	○	○
<i>Cystidia stratonice</i> (Stoll)		○		○	○	○	
<i>Daimio tethys</i> (Mntris)				○	○	○	○
<i>Damora sagana</i> (Doubleday)	○	○	○	○	○	○	
<i>Descoregga simplex</i> Butler						○	
<i>Devenilia corearia</i> (Leech)		○				○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Diarsia canescens</i> (Butler)					○	○	
<i>Diarsia deparca</i> (Butler)						○	
<i>Diasemia accalis</i> (Walker)							○
<i>Dichrocrocis chlorophanta</i> (Butler)	○			○	○	○	
<i>Dichrocrocis punctiferalis</i> (Guene)					○	○	
<i>Diomea discisigna</i> Sugi					○		
<i>Dioryctria sylvestrella</i> (Ratzeburg)						○	
<i>Diphtherocone alpium</i> (Osbeck)						○	
<i>Diphtherocone fulvicollis</i> (Lattin)						○	
<i>Dolbina exacta</i> Staudinger						○	
<i>Drepana curvatula</i> (Borkhausen)					○		
<i>Earias pudicana</i> Staudinger						○	
<i>Ecliptopera umbrosaria</i> (Motschulsky)						○	
<i>Ectropis excellens</i> (Butler)					○		
<i>Edessena hamada</i> (Felder et Rogenhofer)		○		○	○	○	
<i>Eilema deplana</i> (Esper)					○	○	
<i>Endotricha consocia</i> (Butler)						○	
<i>Endotricha kuznetzovi</i> Whalley	○			○			
<i>Endotricha olivacealis</i> (Bremer)		○	○	○		○	○
<i>Epiblema foenella</i> (Linne)	○			○			
<i>Epinotia bicolor</i> (Walsingham)	○			○			
<i>Ercheia niveostrigata</i> Warren					○	○	
<i>Ercheia umbrosa</i> Butler	○			○	○		
<i>Erynnis montanus</i> (Bremer)						○	
<i>Erythrophusia rutilifrons</i> (Walker)						○	
<i>Eucosma metzneriana</i> (Bremer)				○			
<i>Eucosma nipponica</i> Kennel				○			
<i>Eulithis ledereri</i> (Bremer)	○	○		○	○		
<i>Eupithecia gigantea</i> Staudinger					○		
<i>Euproctis piperita</i> Oberthr			○		○		
<i>Euproctis pulverea</i> (Leech)			○		○	○	
<i>Euproctis similis</i> (Fuessly)				○		○	
<i>Euproctis subflava</i> (Bremer)	○	○		○	○		
<i>Eurema laeta</i> (Boisduval)							○
<i>Eurrhyarodes contortalis</i> Hampson				○		○	
<i>Everes argiades</i> (Pallas)	○	○	○	○	○	○	○
<i>Fabriciana nerippe</i> (C. et R. Felder)		○		○			
<i>Fascellina chromataria</i> Walker					○		
<i>Favonius orientalis</i> (Murray)							○
<i>Fentonia ocypte</i> (Bremer)						○	
<i>Furcula infumata</i> (Leech)				○			
<i>Geometra dieckmanni</i> Graeser		○			○		
<i>Geometra glaucaria</i> (Fabricius)						○	
<i>Glaucorhoe unduliferaria</i> (Motschulsky)		○					
<i>Glyphodes duplicalia</i> Inoue						○	○
<i>Gonepatica opalina</i> (Butler)		○		○			
<i>Grapholita delinea</i> Walker		○		○	○		○
<i>Habrosyne aurorina</i> (Bremer)						○	
<i>Habrosyne pyritoides</i> (Hufnagel)				○	○		
<i>Hadennia incongruens</i> (Butler)		○				○	
<i>Hadjina chinensis</i> (Wallengren)		○	○	○			
<i>Harpyia umbrosa</i> Graeser						○	
<i>Hedylepta indicata</i> (Fabricius)						○	
<i>Helicoverpa armigera</i> (Hbner)		○					
<i>Helicoverpa assulta</i> (Guenee)						○	
<i>Heliothis maritima</i> Graslin	○			○			
<i>Hemaris affinis</i> (Bremer)					○		
<i>Hemistola zimmermanni</i> (Hedemann)	○			○			
<i>Hemithea aestivaria</i> (Hbner)		○					

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Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Herculia orthogramma</i> Inoue					○		
<i>Herculia pelasgalis</i> (Walker)	○		○	○	○	○	
<i>Herminia arenosa</i> Butler						○	
<i>Herminia tarsicrinalis</i> (Knoch)					○		
<i>Hermonassa cecilia</i> Butler					○		
<i>Herpetogramma luctuosalis</i> (Guene)		○		○	○		
<i>Herpetogramma rudis</i> (Warren)						○	
<i>Hestina assimilis</i> (Linne)				○		○	○
<i>Hetearmia dissimilis</i> (Butler)						○	
<i>Heterarmia charon</i> Wehrli						○	
<i>Heterolocha aristonaria</i> (Walker)		○		○		○	
<i>Heterostegane cararia</i> (Hbner)					○		
<i>Heterothera postalbida</i> (Wileman)					○		
<i>Hoplodrina implacata</i> (Wileman et West)						○	
<i>Hymenia recurvalis</i> (Fabricius)					○		○
<i>Hypena (Pomolocha) bicoloralis</i> Graeser					○		
<i>Hypena trigonalis</i> (Guene)					○		
<i>Hypomecis crassestrigata</i> (Oberthur)						○	
<i>Hypomecis punctinalis</i> (Scopoli)							○
<i>Hypomecis roboraria</i> (Denis et Schifferrmiller)		○					
<i>Hyposada brunnea</i> (Leech)					○		
<i>Hypsotropha solipunctella</i> Ragonot						○	
<i>Idaea muricata</i> (Hufnagel)						○	
<i>Iragaodes nobilis</i> (Staudinger)						○	
<i>Ivela auripes</i> (Butler)						○	
<i>Jankowskia fuscaria</i> (Leech)		○					
<i>Japonica lutea</i> (Hewitson)			○			○	
<i>Japonica saepestriata</i> (Lederer)						○	
<i>Jocara melanobasis</i> (Hampson)						○	
<i>Jodis lactearia</i> (Linn)						○	
<i>Kaniska canace</i> (Linn)		○		○	○	○	
<i>Koyaga falsa</i> (Butler)					○		
<i>Lagoptera juno</i> (Dalman)					○	○	
<i>Lamoria glaucalis</i> Caradja	○	○	○	○		○	○
<i>Lampides boeticus</i> (Linn)		○					
<i>Langia zenzeroides</i> Moore						○	
<i>Latoia consocia</i> (Walker)	○			○		○	
<i>Latoia sinica</i> (Graeser)						○	
<i>Leiostola mollis</i> (Butler)	○			○		○	
<i>Lethe diana</i> (Butler)							○
<i>Libythea celtis</i> Fuessly						○	
<i>Limenitis doerriesi</i> Staudinger	○	○		○	○	○	○
<i>Limenitis helmanni</i> Lederer			○	○	○	○	○
<i>Limenitis homeyeri</i> Tancr		○					
<i>Lithosia quadra</i> (Linn)						○	
<i>Lobesia cocophaga</i> (Clerk)				○			
<i>Lobesia reliquana</i> Meyrick				○			
<i>Lobocla bifasciata</i> (Bremer et Grey)	○	○	○	○	○	○	
<i>Lophomilia polybapta</i> (Butler)						○	
<i>Lycaena dispar</i> (Haworth)	○			○	○		
<i>Lycaena phlaeas</i> (Linne)	○	○	○	○	○	○	○
<i>Lygephila vulcanica</i> (Butler)		○				○	
<i>Lymantria dispar</i> (Linne)						○	
<i>Lymantria mathura</i> Moore		○					
<i>Macdunnoughia purissima</i> (Butler)						○	
<i>Macroglossum bombylans</i> Boisduval		○					○
<i>Macroglossum pyrrhosticta</i> Butler		○					
<i>Macroglossum saga</i> Butler						○	
<i>Macroglossum stellaparum</i> (Linne)						○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Maliattha chalcogramma</i> Bryk				○			
<i>Maliattha signifera</i> (Walker)	○			○			
<i>Maruca testulalis</i> Geyer		○			○	○	○
<i>Marumba gaschkewitschii</i> (Bremer et Grey)						○	
<i>Marumba sperchius</i> (Menetries)	○			○			
<i>Melanargia epimede</i> (Staudinger)				○		○	
<i>Menophra emaria</i> (Butler)						○	
<i>Menophra senilis</i> (Butler)						○	
<i>Merasmia limbalis</i> (Wileman)				○		○	
<i>Metopta rectifasciata</i> (Mntris)						○	
<i>Miltochrista aberrans</i> Butler				○		○	
<i>Miltochrista miniata</i> (Lederer)				○			
<i>Miltochrista pallida</i> (Bremer)						○	
<i>Miltochrista pulchra</i> Butler						○	
<i>Miltochrista striata</i> (Bremer et Grey)		○	○		○	○	
<i>Miltochrista ziczac</i> (Walker)						○	
<i>Mimeusemia persimilis</i> Butler						○	
<i>Minois dryas</i> (Scopoli)	○	○		○	○	○	
<i>Mocis ancilla</i> (Warren)		○		○		○	
<i>Monema flavescens</i> Walker			○	○		○	
<i>Mycalesis francisca</i> (Cramer)					○		
<i>Mycalesis gotama</i> Moore		○	○	○	○	○	○
<i>Mythimna turca</i> (Linn)					○	○	
<i>Naranga aenescens</i> Moore		○	○		○	○	
<i>Narosa fulgens</i> (Leech)	○			○			
<i>Narosoides flavidorsalis</i> (Staudinger)					○	○	
<i>Narosoides fuscicostalis</i> (Fixsen)					○		
<i>Natarosa subrosea</i> Wileman				○		○	
<i>Negritothoripa hampsoni</i> (Wileman)						○	
<i>Neodrymonia delia</i> (Leech)						○	
<i>Neohipparchus vallata</i> (Butler)						○	
<i>Neopediasia mixtalalis</i> (Walker)						○	
<i>Neptis alwina</i> (Bremer et Grey)	○		○	○	○	○	
<i>Neptis philyroides</i> Staudinger					○		
<i>Neptis pryeri</i> Butler	○			○	○	○	○
<i>Neptis sappho</i> (Pallas)	○	○		○	○	○	○
<i>Neptis thisbe</i> Menetries						○	
<i>Neustrotia noloides</i> (Butler)				○		○	
<i>Niphonyx segregata</i> (Butler)		○	○	○	○	○	○
<i>Nomophila noctuella</i> (Denis et Schiffermuller)							○
<i>Nordstr omia japonica</i> (Moore)					○		
<i>Notarcha derogata</i> (Fabricius)						○	
<i>Notocelia rosaecolana</i> (Doubleday)	○			○			
<i>Notodonta basilinea</i> (Wileman)					○	○	
<i>Nymphula fengwhanalisis</i> (Pryer)			○	○			
<i>Nymphula responsalis</i> (Walker)	○		○	○	○		
<i>Obeidia tigrata</i> (Guene)					○		
<i>Ochlodes ochracea</i> Meyrick						○	
<i>Ochlodes subhyalina</i> (Bremer et Grey)	○	○	○	○	○	○	
<i>Odonestis pruni</i> (Linn)		○					
<i>Oedematopoda ignipicta</i> (Butler)					○		
<i>Oligonyx vulnerata</i> (Butler)	○			○		○	
<i>Oncocera semirubella</i>	○						
<i>Oncocera semirubella</i> (Scopoli)				○	○	○	
<i>Ophthalmitis albosignaria</i> (Bremer et Grey)						○	
<i>Orthaga achatina</i> Butler		○				○	
<i>Orthaga olivacea</i> (Warren)						○	
<i>Orthonama obstipata</i> (Fabricius)						○	
<i>Orthopygia glaucinalis</i> (Linn)						○	○

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Orthopygia placens</i> (Butler)						○	
<i>Orthosia ella</i> (Butler)						○	
<i>Orthosia limbata</i> (Butler)						○	
<i>Ostrinia furnacalis</i> (Guene)						○	
<i>Ostrinia orientalis</i> Mutuura et Munroe						○	
<i>Ostrinia scapulalis</i> (Walker)						○	
<i>Ostrinia zaguliaevi</i> Mutuura et Munroe						○	
<i>Ourapteryx persica</i> Mntris		○			○		
<i>Palpita indica</i> (Saunders)		○					
<i>Palpita nigropunctalis</i> (Bremer)						○	
<i>Pandemis corylana</i> (Fabricius)	○			○			
<i>Pangrapta flavomaculata</i> Staudinger			○		○	○	
<i>Pangrapta marmorata</i> Staudinger				○			
<i>Papilio bianor</i> Cramer	○	○	○	○		○	○
<i>Papilio maackii</i> Menetries		○	○	○	○		
<i>Papilio macilentus</i> Janson		○		○	○	○	○
<i>Papilio xuthus</i> Linne	○	○	○	○	○	○	○
<i>Parabapta aetheriata</i> (Graeser)						○	
<i>Parabapta clarissa</i> (Butler)					○	○	
<i>Paracolax contigua</i> (Leech)						○	
<i>Paracolax pryeri</i> (Butler)						○	
<i>Paraona staudingeri</i> Alphraky						○	
<i>Pareclipsis gracilis</i> (Butler)	○		○	○	○		
<i>Parectropis nigrosparsa</i> (Wileman et South)					○		
<i>Parnara guttata</i> (Bremer et Grey)		○		○	○	○	○
<i>Parnassius stubbendorfii</i> Mntris		○					
<i>Peridea elzet</i> Kiriakoff					○		
<i>Peridea oberthueri</i> (Staudinger)						○	
<i>Perynea subrosea</i> (Butler)						○	
<i>Petrophora chlorosata</i> (Scopoli)						○	
<i>Phalera angustipennis</i> Matsumura		○			○	○	
<i>Phalera assimilis</i> (Bremer et Grey)		○			○	○	
<i>Phalera sangana</i> (Butler)						○	
<i>Phillosphingia dissimilis</i> (Bremer)						○	
<i>Phlossa conjuncta</i> (Walker)		○				○	
<i>Phthonosema tendinosaria</i> (Bremer)					○	○	
<i>Phyllophila oblitterata</i> (Rambur)	○		○	○		○	
<i>Plagodis pulveraria</i> (Linne)	○			○			
<i>Plapilio machaon</i> Linne	○			○			
<i>Platysenta cyclica</i> (Hampson)	○			○			
<i>Pleuroptya harutai</i> (Denis et Schiffermuller)						○	
<i>Pleuroptya quadrimaculalis</i> (Kollar)						○	
<i>Pleuroptya ruralis</i> (Scopoli)		○	○	○	○		
<i>Plusiodonta casta</i> (Butler)						○	○
<i>Phutella xylostella</i> (Linn)				○	○	○	
<i>Polygonia c-aureum</i> (Linne)	○	○	○	○	○	○	○
<i>Protodeltote pygarga</i> (Hufnagel)						○	
<i>Pseudacrobasis nankingella</i> (Roessler)				○		○	
<i>Pseudaletia separata</i> (Walker)		○			○		
<i>Pseudoips fagana</i> (Fabricius)						○	
<i>Pseudoips sylpha</i> Butler						○	
<i>Pseudozizeeria maha</i> (Kollar)	○	○		○	○	○	○
<i>Psilogramma increta</i> (Walker)					○		
<i>Pterostoma sinicum</i> Moore	○	○		○	○	○	
<i>Pteropteryx spiloessa</i> Meryck				○			
<i>Pyrallis regalis</i> Caradja				○			
<i>Pyrausta panopealis</i> (Walker)						○	
<i>Quadricalcarifera pryeri</i> (Leech)						○	
<i>Rabta cristata</i> (Butler)	○			○	○	○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Rapala caerulea</i> (Bremer et Grey)	○			○	○	○	○
<i>Rhagastis mongoliana</i> (Butler)					○	○	
<i>Rhamnosa angulata</i> (Walker)				○			
<i>Rhodoneura erecta</i> (Leech)						○	
<i>Rhyarioides nebulosus</i> Butler	○			○			
<i>Rikiosatoa grisea</i> (Butler)		○		○			
<i>Sacada appoximans</i> (Leech)						○	
<i>Sarbanissa subflava</i> (Leech)				○			
<i>Sarbanissa venusta</i> (Leech)						○	
<i>Scirpophaga parvalis</i> (Wileman)			○				
<i>Scopula emissaria</i> (Walker)			○				
<i>Scopula hanna</i> (Butler)					○		
<i>Scopula ignobilis</i> (Warren)						○	
<i>Scopula superior</i> (Butler)	○			○		○	
<i>Scythris sinensis</i> (Felder et Rogenhofer)		○		○			
<i>Semnostola magnifisa</i> (Kuznetsov)	○			○			
<i>Sericinus montela</i> Gray		○					
<i>Simplicia niphona</i> (Butler)					○		
<i>Sineugraphe bipartita</i> (Graeser)						○	
<i>Sineugraphe oceanica</i> (Kardakoff)	○			○			
<i>Sitochroa verticalis</i> (Linnaeus)						○	
<i>Spatalia doerriesi</i> Graeser	○			○			
<i>Sphragifera biplagiata</i> (Walker)	○			○		○	
<i>Spilarctia seriatopunctata</i> Motschulsky	○		○	○		○	
<i>Spilarctia subcarnea</i> Walker					○		
<i>Spilosoma lubricipeda</i> (Linne)	○		○	○	○	○	
<i>Spilosoma punctaria</i> (Stoll)		○				○	
<i>Spirama retorta</i> (Clerck)			○	○	○		○
<i>Spodoptera depravata</i> (Butler)						○	
<i>Statherotmantis shicotana</i> (Kuznetsov)	○			○			
<i>Stemmatophora tsushimensis</i> Inoue			○				
<i>Stemmatophora valida</i> (Butler)		○		○	○	○	
<i>Stenbergmania albomaculalis</i> (Bremer)						○	
<i>Stigmatophora flava</i> (Bremer et Grey)	○			○	○	○	
<i>Striglina cancellata</i> (Christoph)	○			○	○	○	
<i>Striglina fixseni</i> Loginova						○	
<i>Sylepta pallidinotalis</i> (Hampson)			○				
<i>Sylepta segnalis</i> (Leech)		○		○	○	○	
<i>Tamraca torridalis</i> (Lederer)			○		○	○	
<i>Taraka hamada</i> (Janson)						○	
<i>Tegulifera bicoloralis</i> (Leech)				○			
<i>Teliphasa albifusa</i> (Hampson)					○		
<i>Tephрина vapulata</i> (Butler)						○	
<i>Termioptycha nigrescens</i> (Warren)						○	
<i>Tethea albicostata</i> (Butler)				○			
<i>Tethea ampliata</i> (Butler)		○		○	○	○	
<i>Tethea octogesima</i> (Butler)				○	○		
<i>Theretra japonica</i> (Boisduval)	○	○		○	○		
<i>Thinopteryx delectans</i> (Leech)				○			
<i>Thiotricha pontifera</i> (Meyrick)	○			○			
<i>Thosea sinensis coreana</i> Okano et Pak	○			○			
<i>Thymelicus sylvaticus</i> (Bremer)	○			○			
<i>Thyris fenestrella seoulensis</i> Park et Byun					○		
<i>Timandra comptaria</i> Walker					○		
<i>Timandra griseata</i> Petersen	○			○			
<i>Tongeia fischeri</i> (Evermann)	○		○	○	○	○	
<i>Tyrolimnas anthraconesa</i> Meyrick	○			○			
<i>Urespita gracilis</i> (Butler)						○	
<i>Urodonta branickii</i> (Oberthr)						○	

Appendix 1. Continued

Scientific Name	Baengnyeongdo	Boleumdo	Daecheongdo	Gangwhado	Gyodongdo	Seokmodo	Yeonpyeongdo
<i>Vanessa indica</i> (Herbst)		○				○	○
<i>Xestia kollari</i> (Lederer)						○	
<i>Xestia stupenda</i> (Butler)						○	
<i>Yponomeuta evonymellus</i> (Linne)	○			○			
<i>Ypthima amphithea</i> Menetries	○		○	○		○	
<i>Ypthima argus</i> Butler		○		○	○		
<i>Ypthima motschulskyi</i> (Bremer et Grey)						○	○
<i>Zanclognatha griselda</i> (Butler)		○					
<i>Zanclognatha sugii</i> Owada	○			○			
<i>Zanclognatha tarsipennalis</i> (Treitschke)						○	
<i>Zethenia albonotaria</i> (Butler)				○			
<i>Zethenia rufescentaria</i> (Clerck)					○		
<i>Zeuzera multistrigata</i> Moore				○		○	